Form 1271B

TB Wood's

UVC Option Boards

Installation and Reference Manual

for the

Resolver and Encoder Circuit Boards

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Chambersburg, Pennsylvania

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Section 1: Introduction

1.1 Product Overview

Two circuit boards may be added to the UVC inverter to enhance its capabilities:

- The Encoder Board, which reads the feedback device to provide better control of motors attached to UVC inverters. It is described in detail in Section 2.
- The Resolver Board, which is a device that permits more precise positioning of motor shafts. It is described in detail in Section 3.

1.2 Manual Overview

This manual provides information on installing and configuring the optional circuit boards for UVC inverters. Information on setting UVC parameters appropriately and resolving abnormal operation is also provided.

1.3 Related Documentation

For additional information on UVC inverters, consult Form 1336 (Installation Manual for the UVC Inverter) and Form 1337 (Configuration Manual for the UVC Inverter).

1.4 Publication History

Date	Form Number	Nature of Change
June 1999	1271	First release.
July 1999	1271A	Added part numbers for the two circuit boards.
February 2001	1271B	Revised Resolver information due to new design of Resolver board.

N O T E S

Section 2: The Encoder Board

2.1 Overview

The Encoder Board (part number 34500363K0) is an optional printed circuit board that may be added to the UVC inverter. It reads the feedback device to provide better control of motors attached to UVC inverters.

2.2 Specifications

Encoder fixed voltage supply	24 Vdc
Encoder variable voltage supply	5 to 17 Vdc, configurable by jumpers J1 and J2 (see page 10)
Maximum supply current	300 mA
Maximum Encoder pulse frequency	330 kHz
Slave Out (X4) output	See jumper J3 on page 11
Speed reference input/voltage (V_IN; see UVC parameter P_31)	0 to 10 Vdc, ± 10 Vdc, or 2 to 10 Vdc
V_IN resolution input	Standard: 10 bit Optional: 12 bit (see jumper S1 on page 12 for selecting optional resolution)
Input resistor	100 kΩ
Other signal inputs	See the Configuration Manual (Form 1337)
Input resistors of other encoder systems: TTL HCL Open Collector	 150R, or 150R and 1nF in series (default) 4.4 kΩ 4.7 kΩ
Scanning rate input reference	1 ms
Scanning rate digital inputs	8 ms

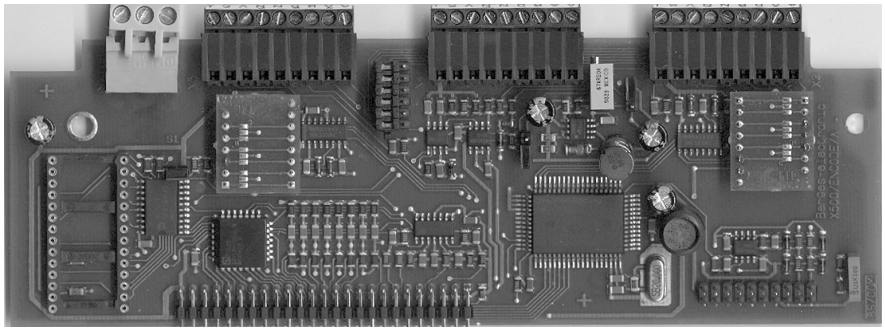

Figure 1: The UVC Encoder Board

2.3 Installation

⚠ DANGER

HAZARDOUS VOLTAGE

Before servicing the electrical system:

- Disconnect all power.
- Wait five minutes until DC bus capacitors discharge. In the event of malfunctions, the discharge time of five minutes may be exceeded **substantially**. Hazardous voltages are still present in the unit for as long as the BUS CHG lamp is lit.

Failure to observe this instruction will result in death or serious injury.

⚠ DANGER

TENSION DANGEREUSE

Avant de procéder à la maintenance du système électrique:

- Débrancher intégralement l'alimentation électrique.
- Attendre cinq minutes pour la décharge des condensateurs du bus DC. En cas de panne, la durée de décharge peut être **considérablement** supérieure à cinq minutes. Des tensions dangereuses restent présentes au niveau de l'appareil tant que le voyant BUS CHG est allumé.

Le non respect de cette instruction présente un danger de mort ou de blessures graves.

Perform the following steps to install the Encoder Board:

1. Disconnect all power and wait until the BUS CHG lamp goes out.
2. Re-locate the inverter to a stable flat surface, and lay the inverter on its left side (as viewed from the front of the inverter).
3. Remove the lower front panel by removing the black screw located at the bottom of the lower front panel.
4. Remove the upper front panel by gently pulling the black frame away from the inverter chassis.
5. Remove the right side panel of the UVC inverter by unscrewing the upper and lower screws holding the panel in place. Note that metal ears on the back of the side panel hold the panel in place; after removing the screws, swing the panel outward from the front and then slide the metal ears out of the holes.

6. The Encoder board is installed below the main circuit board of the UVC inverter; see Figure 2 on page 6 for guidance.
7. Place the plastic spacers that came with the Encoder board over the two mounting holes in the inverter chassis (see Figure 2).
8. Gently align the pins of the connector strip on the Encoder board with the pins of the inverter. See Figures 2 and 3 on pages 6 and 7 for guidance.
9. When the pins are aligned, gently push the two connector strips together until the Encoder board is securely attached to the main board of the UVC inverter. The mounting holes in the Encoder board should align with the mounting holes in the chassis.
10. Secure the Encoder board to the inverter chassis by placing the screws that came with the Encoder board through the mounting holes in the board, then through the plastic spacers, and finally into the threads in the inverter chassis. Tighten snugly, but do not overtighten.
11. Locate the ribbon cable that came with the Encoder board and attach one end to the ribbon strip connector on the Encoder board and the other end to the ribbon strip connector on the main circuit board of the UVC inverter. See Figures 2 and 3 on pages 6 and 7 for guidance.
12. The lower portions of the connector blocks (KL3, X5, X4, and X3; see Figure 3 on page 7) may be slid out of the connector blocks. Remove the lower portions from each connector block. (This will allow the side panel to be replaced.)
13. Replace the side panel by sliding the metal ears into the holes on the back of the inverter chassis and gently pushing the panel closed. Note that the keypad must be held in place by the detents on the front of the panel.
14. Secure the side panel by replacing the screws removed in step 4.
15. Re-insert the lower portions of each connector block into the appropriate connector block. (Alternately, you may first wire each connector block, as described in Section 2.4, and then replace the lower portion of the connector block.)
16. Replace the upper front panel by sliding it onto the chassis.
17. Replace the lower front panel and secure with the screw.

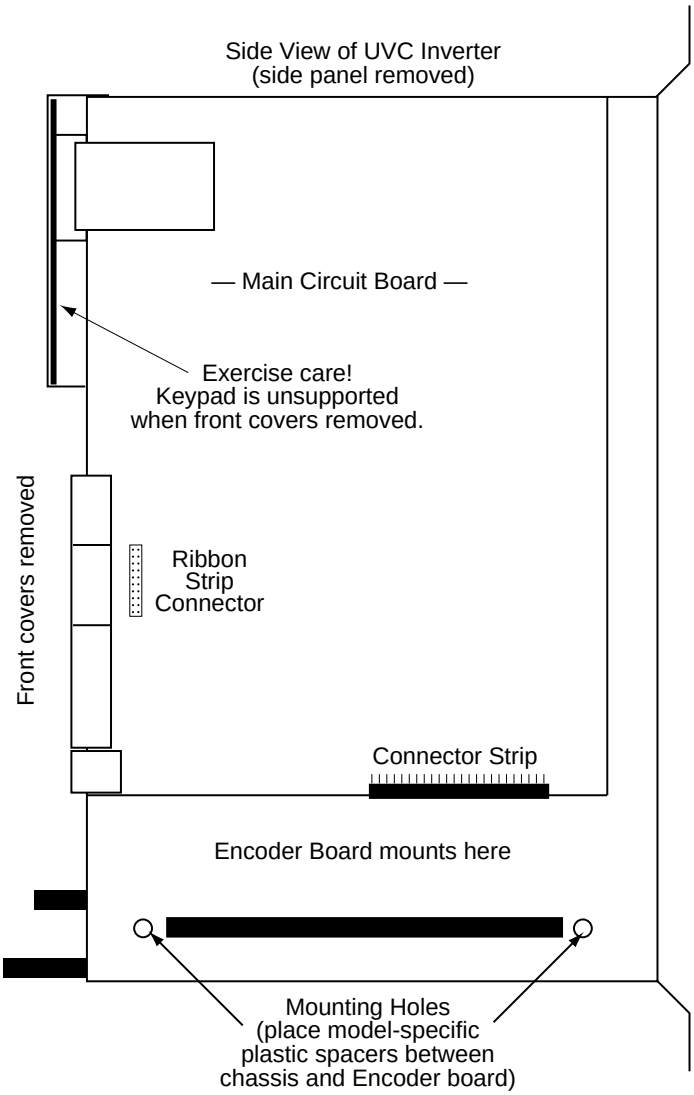

Figure 2: Mounting Location for Encoder Board and Connections

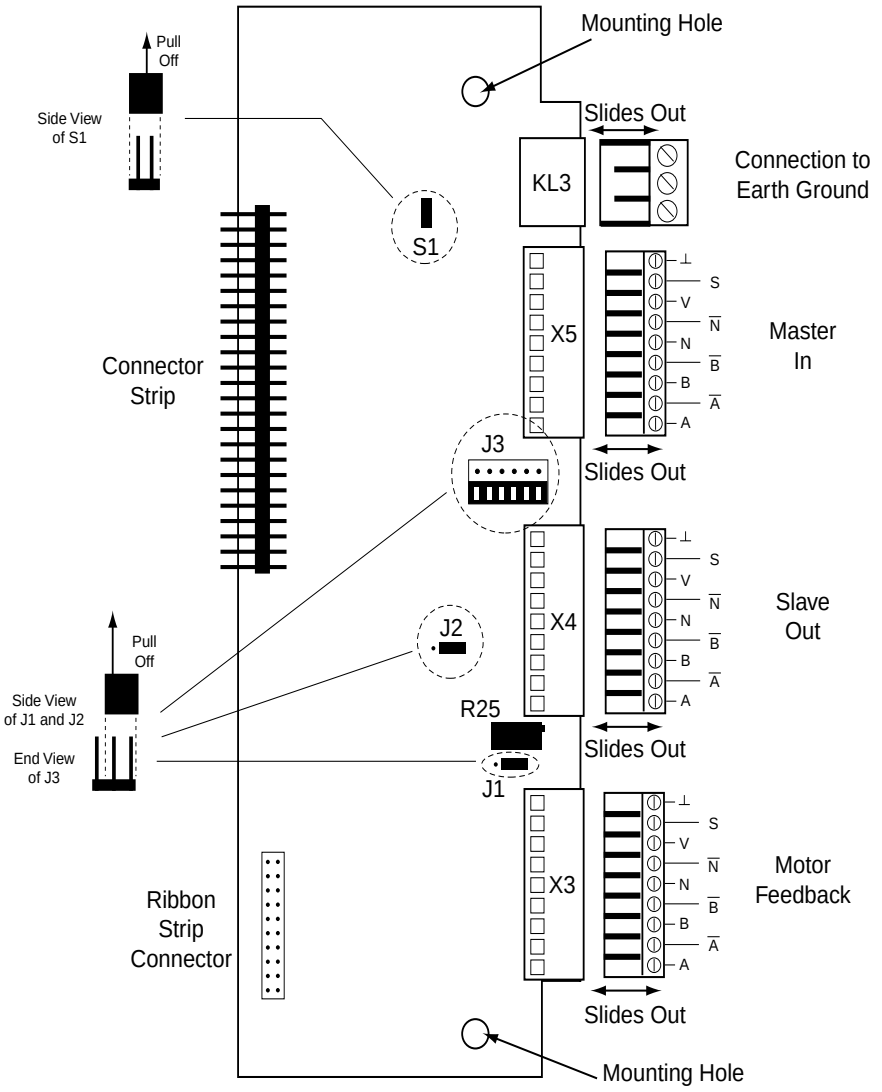

Figure 3: Principal Components of the Encoder Board

2.4 Connections

As shown in Figure 3 on page 7, the Encoder board provides four connection blocks:

- KL3
- X5 (Master In)
- X4 (Slave Out)
- X3 (Motor Feedback)

The following table describes the connections that are made to these four connection blocks.

Table 1: Description of Encoder Board Control Terminals

Terminal	Description
KL3 Connection Block	
—	Three connections are provided for connections to earth ground.
X5 Connection Block (Master In)	
⊥	Signal common. Reference for signal input from the Encoder.
S	Test signal connection for broken cable and feedback for the variable output on terminal V. If the circuit between this terminal and terminal V is interrupted, Fault 14 will be generated by the UVC inverter. Note that if the S and V terminals are not connected together, the voltage will be fixed at 17 Vdc — which may damage components designed for 5 Vdc.
V	Output supply voltage. The amount of voltage output is dependent on the setting of jumper J1; see page 10.
$\overline{N}$	Digital input from the Encoder (negative lead). Inverter signal “marker pulse” is one pulse per revolution.
N	Digital input from the Encoder (positive lead).
$\overline{B}$	Inverted digital input from the Encoder (negative lead). The number of pulses must be set in Parameter 36 of the UVC inverter.
B	Digital input from the Encoder (positive lead).
$\overline{A}$	Inverted digital input from the Encoder (negative lead). The number of pulses must be set in Parameter 36 of the UVC inverter.
A	Digital input from the Encoder (positive lead).
X4 Connection Block (Slave Out)	
⊥	Signal common. Reference for signal input from the Encoder.
S	Not used.
V	Not used.

Table 1: Description of Encoder Board Control Terminals

Terminal	Description
$\overline{N}$	Digital output from the Encoder (negative lead). The “marker pulse” is equal to the input pulse selected by jumper J3; see page 11.
N	Digital output from the Encoder (positive lead).
$\overline{B}$	Inverted digital input from the Encoder (negative lead). The number of pulses must be set in Parameter 36 of the UVC inverter.
B	Digital input from the Encoder (positive lead).
$\overline{A}$	Inverted digital input from the Encoder (negative lead). The number of pulses must be set in Parameter 36 of the UVC inverter.
A	Digital input from the Encoder (positive lead).
X3 Connection Block (Motor Feedback)	
⊥	Signal common. Reference for signal input from the Encoder.
S	Test signal connection for broken cable and feedback for the variable output on terminal V. If the circuit between this terminal and terminal V is interrupted, Fault 14 will be generated by the UVC inverter. Note that if the S and V terminals are not connected together, the voltage will be fixed at 17 Vdc — which may damage components designed for 5 Vdc.
V	Output supply voltage. The amount of voltage output is dependent on the setting of jumper J1; see page 10.
$\overline{N}$	Digital input from the Encoder (negative lead). Inverter signal “marker pulse” is one pulse per revolution.
N	Digital input from the Encoder (positive lead).
$\overline{B}$	Inverted digital input from the Encoder (negative lead). The number of pulses must be set in Parameter 36 of the UVC inverter.
B	Digital input from the Encoder (positive lead).
$\overline{A}$	Inverted digital input from the Encoder (negative lead). The number of pulses must be set in Parameter 36 of the UVC inverter.
A	Digital input from the Encoder (positive lead).

2.5 Configuration of Encoder Jumpers

2.5.1 Configuring the Voltage Supply

Jumpers J1 and J2 configure the voltage supply to the Encoder board. Figure 3 on page 7 shows the location of these two jumpers. The jumpers must be set in an opposite fashion. For example, if jumper J2 is in positions 1-2, then jumper J1 must be in positions 2-3. Similarly, if jumper J2 is in positions 2-3, then jumper J1 must be in positions 1-2.

Each jumper is comprised of three pins and a square, black jumper, which covers two of the pins. If jumper J2 is placed over the middle and right pins (as shown in the righthand drawing in Figure 4), the Encoder board will be configured for variable voltage between 5 and 17 Vdc unless no connection exists between the S and V terminals (in which case it is fixed at 17 Vdc).

The amount of voltage is set with potentiometer R25 located next to the J1 jumper. (For a TTL Encoder, the reference voltage defaults to 5 Vdc; for an HCL Encoder, the reference voltage defaults to 12 Vdc).

If the jumper J2 is placed over the left and middle pins (as shown in the lefthand drawing in Figure 4), the voltage supply is fixed at 24 Vdc. This is for an open collector Encoder.

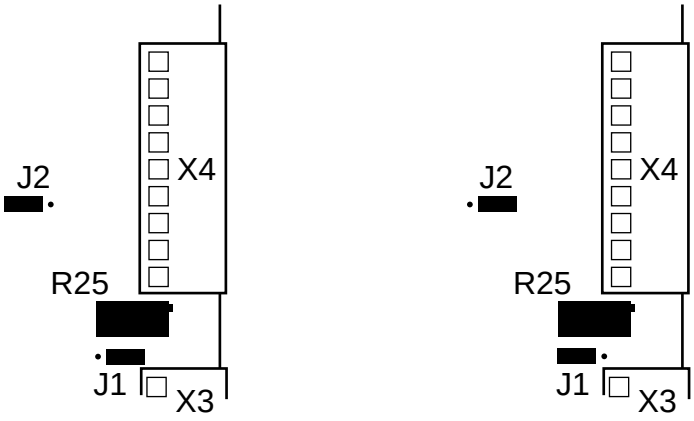

Figure 4: Settings of Jumpers J1 and J2

2.5.2 Configuring the Master/Slave Relationship

Jumper J3 configures whether a particular Encoder board is the master or slave in a multi-Encoder board application. Jumper J3 is located between the X5 and X4 connection blocks; see Figure 3 on page 7.

When the jumper is placed so as to cover the two rows of pins nearer to the X5 connection block, the input signal arriving at the X5 connection block (Master In) is routed to the X4 connection block (Slave Out).

However, when the jumper is placed so as to cover the two rows of pins nearer to the X4 connection block, the input signal arriving at connection block X3 (Motor Feedback) is routed to the X4 connection block (Slave Out).

Figure 5 shows an example of three Encoder boards wired together in a master / slave arrangement with J3 set appropriately.

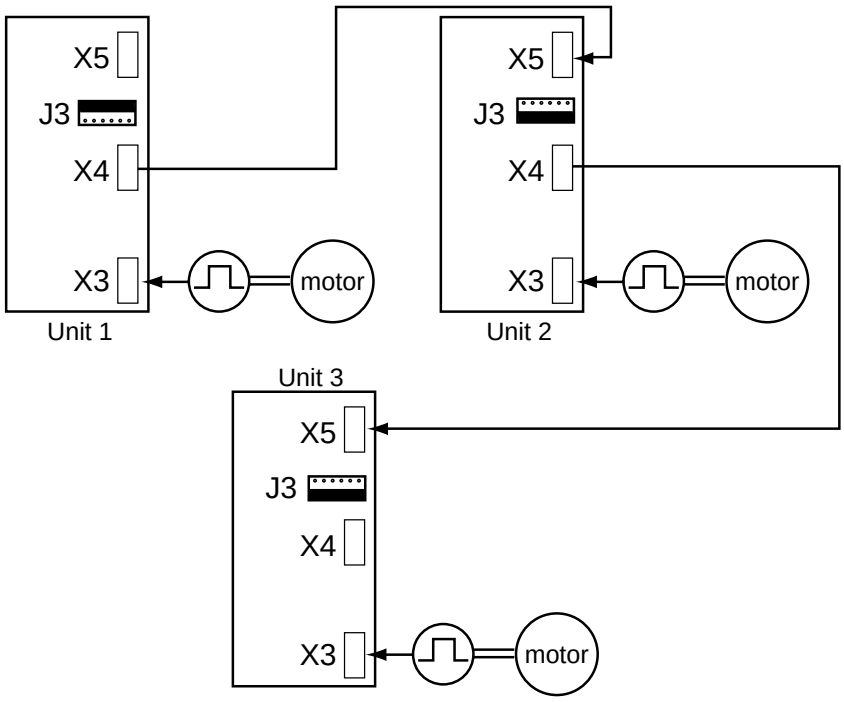

Figure 5: Example of Setting J3 for Master/Slave Configuration

2.5.3 High-Resolution Analog Input

The standard resolution for the Encoder board is 10 bits. This may be increased to 12 bits with optional jumper IC1 (AD862AR-10).

Once you have acquired this part, locate jumper S1 on the Encoder board. It is near the KL3 connection terminal as shown in Figure 3 on page 7. Remove existing jumper S1 and replace it with jumper IC1. The resolution will increase to 12 bits the next time power is cycled.

2.6 UVC Parameter Settings for the Encoder Board

Once the Encoder board is installed and the UVC inverter is powered up, you should enter the necessary operational data by setting the following UVC parameters. See the UVC Programming Manual for further assistance.

1. Select the desired language with parameter 78.
2. Enter the data related to the motor that is connected to the UVC inverter. The parameters in Group 1 are used to record this data. Be careful when setting these parameters as accurate entry of this data is vital for correct measurement and internal processing.
3. Configure the basic parameters found in Group 2.

   Pay particular attention to parameter 2C because this parameter establishes the required drive type. If a mode other than the current mode is selected (for example, EC, NFO, or FO variant), and then a hardware or software reset is performed, mode-specific parameters will be added.

   Once these parameters are added, an Encoder board and an Encoder must be connected or an error message will be generated immediately after power-up.
4. Select the setpoint source by using parameter 31.
5. Select the required start and ramp-up / ramp-down response of the inverter with parameters 71 and 72.
6. Specify whether the inverter should automatically re-start if an error occurs by setting parameters 83 through 85 as needed.
7. Check parameter D1 to determine whether the correct option board was installed.
8. Enter the data specific to the feedback system in parameter BE.

9. Select the test mode specific to the drive type and feedback system with parameter 2A.

   After a hardware reset (power cycle) or software reset (setting parameter 2D to 1), and after the first start command is issued, a test run will be performed. This test determines the data specific to the motor and feedback system.

   If this run completes successfully, the inverter starts and accelerates to the commanded speed or torque. You should then reset parameter 2A to 0 so additional test runs are not performed after each power on.

   If the test run is unsuccessful, an error message is displayed.

2.7 Troubleshooting

Once all parameters are entered, several parameters are available to provide status about the operation of the UVC inverter:

- The actual power-specific data (such as currents and voltages on the line and motor connections) is found in parameter Group 0 (Service Data I).
- The motor model and actual inverter-specific statuses are found in parameter Group E and Group F (Service Data II and III).

For units using feedback, it can sometimes be difficult to locate the condition causing a fault. The following procedure is suggested for this situation:

1. Power up the UVC inverter.
2. Navigate to parameter BB.

   The mechanical rotation angle of the tachometer shaft is read in this parameter. If the parameter setting for the tachometer data (parameter BA or BE) is correct, the display runs through an angle of 360° during each mechanical revolution of the tachometer shaft.

3. Once the settings of the tachometer-specific parameters are checked and verified in step 2, test the power section. This is accomplished by setting parameter 2C to V / Hz-controlled operation (data value 0) and then performing a power cycle. The inverter should run in this mode of operation.

N O T E S

Section 3: The Resolver Board

3.1 Overview

The Resolver board (part number 34500378) is an optional printed circuit board that may be added to the UVC inverter. It acts as a device to provide precise positioning of motor shafts.

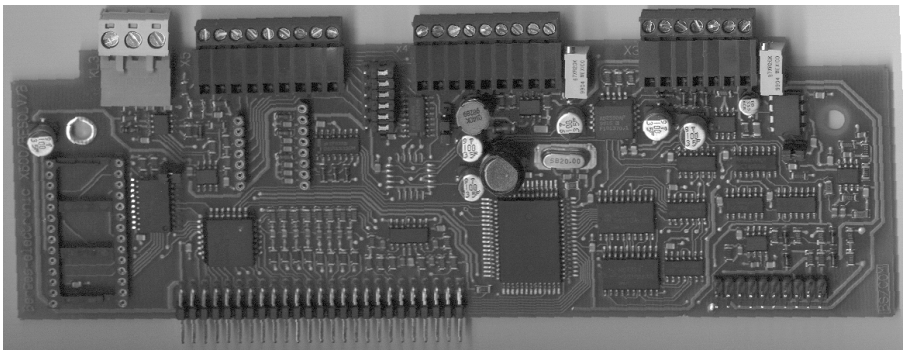

Figure 6: The UVC Resolver Board

3.2 Specifications

Resolver exciting voltage	2.4 to 9.6 Vdc, configurable by jumper S2 and potentiometer R68 (see the description of the EXC terminal on page 22)
Resolver exciting frequency	10 kHz
Resolver-converter input voltage	1.8 to 2.2 Vdc
Encoder fixed voltage supply	24 Vdc
Encoder variable voltage supply	5 to 17 Vdc, configurable by jumpers J2 and potentiometer R25 (see page 23)
Maximum Encoder supply current	300 mA
Maximum Encoder pulse frequency	330 kHz
Slave Out (X4) output	If the output for X4 is routed to X3 (Motor Feedback), the output signal is 5 Vdc (TTL compatible). If the output for X4 is routed to X5 (Master In), the output corresponds to the level of the X5 input; see the description of jumper J3 on page 24 for more information.
Speed reference input / voltage (V_IN; see UVC parameter P_31)	0 to 10 Vdc ±10 Vdc 2 to 10 Vdc
V_IN resolution input	Standard: 10 bit Optional: 12 bit (see jumper S1 on page 25 for selecting optional resolution)
Input resistor	100 kΩ
Other signal inputs	See the Configuration Manual (Form 1337)
Input resistors of other encoder systems: TTL HCL Open Collector (optional NPN or PNP)	 150R, or 150R and 1nF in series (optional) 4.4 kΩ 4.7 kΩ
Scanning rate input reference	1 ms
Scanning rate digital inputs	8 ms

3.3 Installation

⚠ DANGER

HAZARDOUS VOLTAGE

Before servicing the electrical system:

- Disconnect all power.
- Wait five minutes until DC bus capacitors discharge. In the event of malfunctions, the discharge time of five minutes may be exceeded **substantially**. Hazardous voltages are still present in the unit for as long as the BUS CHG lamp is lit.

Failure to observe this instruction will result in death or serious injury.

⚠ DANGER

TENSION DANGEREUSE

Avant de procéder à la maintenance du système électrique:

- Débrancher intégralement l'alimentation électrique.
- Attendre cinq minutes pour la décharge des condensateurs du bus DC. En cas de panne, la durée de décharge peut être **considérablement** supérieure à cinq minutes. Des tensions dangereuses restent présentes au niveau de l'appareil tant que le voyant BUS CHG est allumé.

Le non respect de cette instruction présente un danger de mort ou de blessures graves.

Perform the following steps to install the Resolver Board:

1. Disconnect all power and wait until the BUS CHG lamp goes out.
2. Re-locate the inverter to a stable flat surface, and lay the inverter on its left side (as viewed from the front of the inverter).
3. Remove the lower front panel by removing the black screw located at the bottom of the lower front panel.
4. Remove the upper front panel by gently pulling the black frame away from the inverter chassis.

5. Remove the right side panel of the UVC inverter by unscrewing the upper and lower screws holding the panel in place. Note that metal ears on the back of the side panel hold the panel in place; after removing the screws, swing the panel outward from the front and then slide the metal ears out of the holes.
6. The Resolver board is installed below the main circuit board of the UVC inverter; see Figure 7 on page 19 for guidance.
7. Place the plastic spacers that came with the Resolver board over the two mounting holes in the inverter chassis (see Figure 7).
8. Gently align the pins of the connector strip on the Resolver board with the pins of the inverter. See Figures 7 and 8 on pages 19 and 20 for guidance.
9. When the pins are aligned, gently push the two connector strips together until the Resolver board is securely attached to the main board of the UVC inverter. The mounting holes in the Resolver board should align with the mounting holes in the chassis.
10. Secure the Resolver board to the inverter chassis by placing the screws that came with the Resolver board through the mounting holes in the board, then through the plastic spacers, and finally into the threads in the inverter chassis. Tighten snugly, but do not overtighten.
11. Locate the ribbon cable that came with the Resolver board and attach one end to the ribbon strip connector on the Resolver board and the other end to the ribbon strip connector on the main circuit board of the UVC inverter. See Figures 7 and 8 on pages 19 and 20 for guidance.
12. Replace the side panel by sliding the metal ears into the holes on the back of the inverter chassis and gently pushing the panel closed. Note that the keypad must be held in place by the detents on the front of the panel.
13. Secure the side panel by replacing the screws removed in step 4.
14. Replace the upper front panel by sliding it onto the chassis.
15. Replace the lower front panel and secure with the screw.

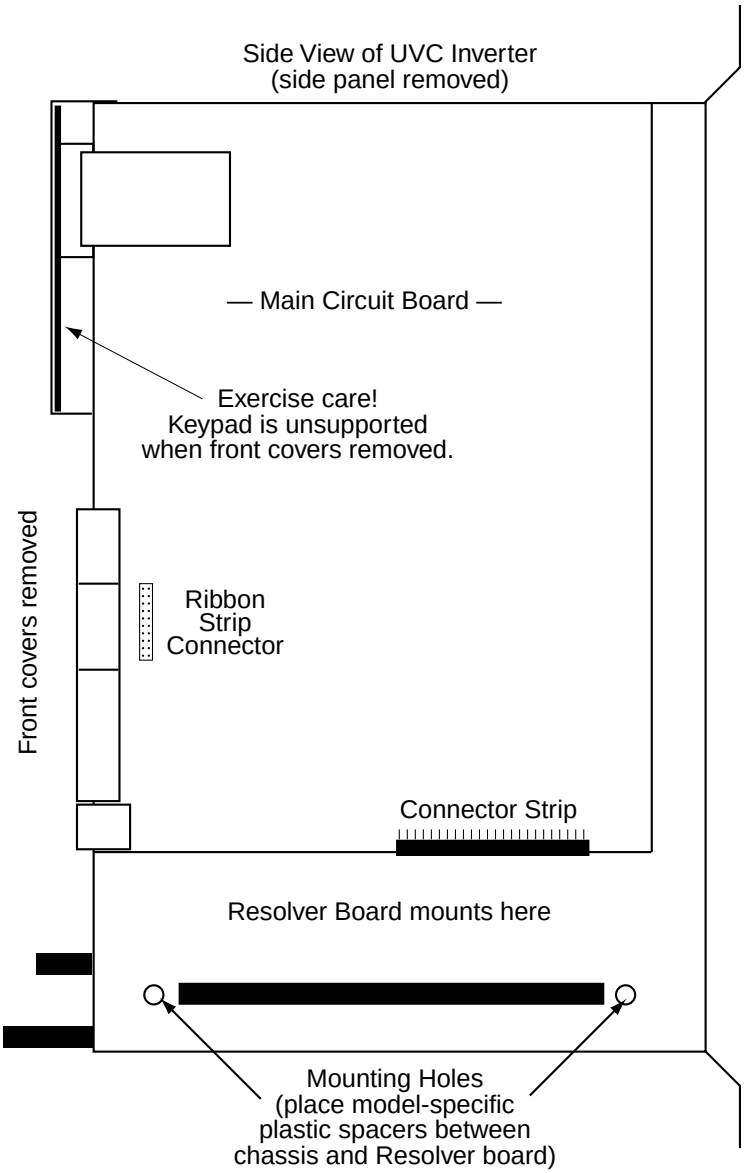

Figure 7: Mounting Location for Resolver Board and Connections

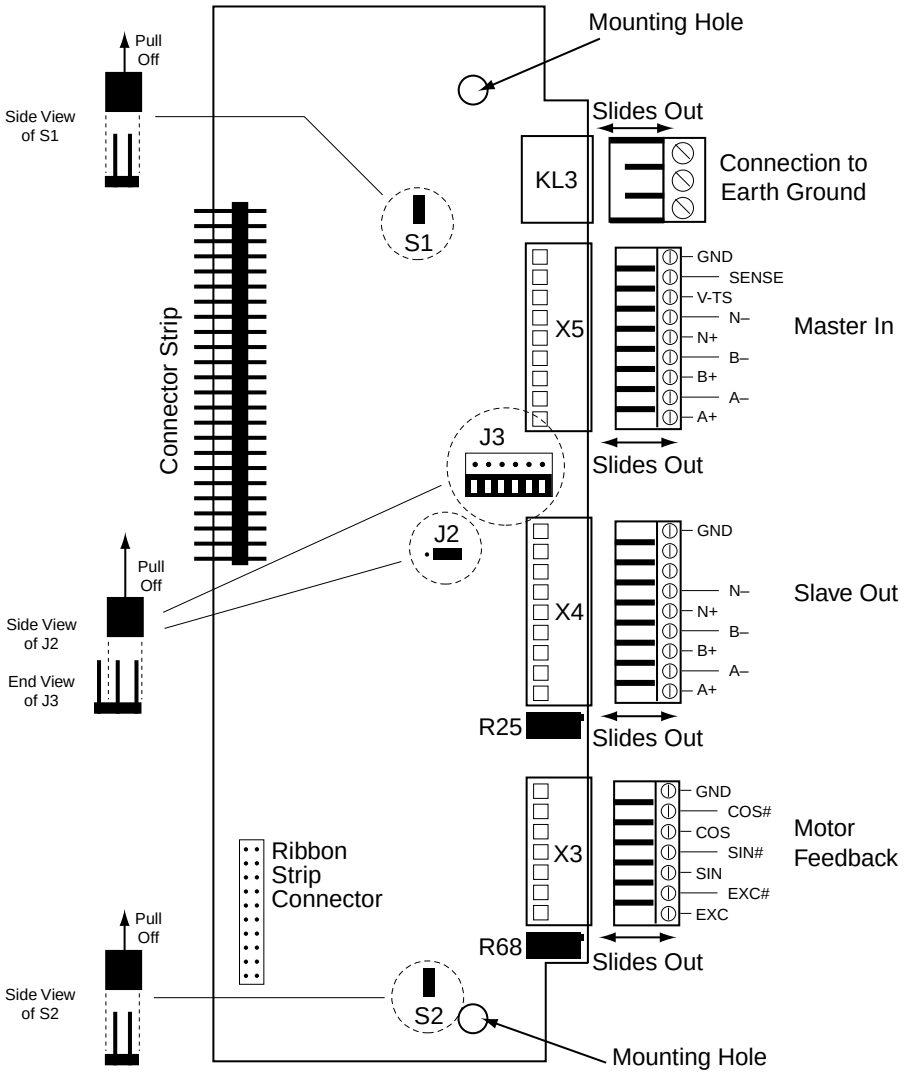

Figure 8: Principal Components of the Resolver Board

3.4 Connections

As shown in Figure 8 on page 20, the Encoder board provides four connection blocks:

- KL3
- X5 (Master In)
- X4 (Slave Out)
- X3 (Motor Feedback)

The following table describes the connections that are made to these four connection blocks.

Table 2: Description of Encoder Board Control Terminals

Terminal	Description
KL3 Connection Block	
—	Three connections are provided for connections to earth ground.
X5 Connection Block (Master In)	
GND	Signal common. Reference for voltage supply of Encoder and shield of Encoder cable.
SENSE	Test signal connection for broken cable and feedback for the variable output on terminal V-TS. If the circuit between this terminal and terminal V-TS is interrupted, and X5 is active (parameter 31 = 8), Fault 14 will be generated by the UVC inverter.
V-TS	Output supply voltage. The amount of voltage output is dependent on the setting of jumper J2; see page 23.
N–	Digital input from the Encoder (negative lead). Inverter signal “marker pulse” is one pulse per revolution.
N+	Digital input from the Encoder (positive lead).
B–	Inverted digital input from the Encoder (negative lead). The number of pulses must be set in Parameter 36 of the UVC inverter.
B+	Digital input from the Encoder (positive lead).
A–	Inverted digital input from the Encoder (negative lead). The number of pulses must be set in Parameter 36 of the UVC inverter.
A+	Digital input from the Encoder (positive lead).

Table 2: Description of Encoder Board Control Terminals

Terminal	Description
X4 Connection Block (Slave Out)	
GND	Signal common. Reference for shielding of encoder cable for another Slave unit.
N–	Digital signal from X5 (Master In) or X3 (Motor Feedback) depending on the setting of jumper J3. The pulse number for the inverted “zero impulse” signal corresponds to the source (either X5 or X3).
N+	Digital signal from X5 or X3 (positive lead).
B–	Digital signal from X5 (Master In) or X3 (Motor Feedback) depending on the setting of jumper J3. The pulse number for the inverted “trace B” signal corresponds to the source (either X5 or X3).
B+	Digital signal from X5 or X3 (positive lead).
A–	Digital signal from X5 (Master In) or X3 (Motor Feedback) depending on the setting of jumper J3. The pulse number for the inverted “trace A” signal corresponds to the source (either X5 or X3).
A+	Digital signal from X5 or X3 (positive lead).
X3 Connection Block (Motor Feedback)	
GND	Signal common. Reference for shielding of Resolver cable.
COS#	Measuring ground for COS.
COS	Analog signal from motor feedback. The number of pole pairs is defined by parameter BA. The maximum voltage should be 1.8 to 2.2 Vdc.
SIN#	Measuring ground for SIN.
SIN	Analog signal from motor feedback. The number of pole pairs is defined by parameter BA. The maximum voltage should be 1.8 to 2.2 Vdc.
EXC#	Ground for EXC.
EXC	Sine-shaped exciting voltage for Resolver. To compensate attenuation of the Resolver and the Resolver line, the exciting voltage must be adjusted. With jumper S2 in place, the output voltage is fixed at 2.4 Vdc. With jumper S2 removed, the voltage may be adjusted up to 9.6 Vdc by using the R68 potentiometer (full clockwise rotation produces maximum voltage). See Figure 8 on page 20 for the locations of jumper S2 and potentiometer R68. Note that the returned COS and SIN signals must have a maximum voltage between 1.8 and 2.2 Vdc.

3.5 Configuration of Resolver Jumpers

3.5.1 Configuring the Voltage Supply

Jumper J2 configures the voltage supply to the Resolver board. Figure 8 on page 20 shows the location of jumper J2.

Jumper J2 is comprised of three pins and a square, black jumper, which covers two of the pins. If the jumper is placed over the middle and right pins (as shown in the righthand drawing in Figure 9), the Resolver board will be configured for variable voltage between 5 and 17 Vdc. The selection of a voltage between these two values is accomplished with potentiometer R25 (which is located between the X4 and X3 connectors). (For a TTL Encoder, the reference voltage defaults to 5 Vdc; for an HCL Encoder, the reference voltage defaults to 12 Vdc).

If the jumper is placed over the left and middle pins of J2 (as shown in the lefthand drawing in Figure 9), the voltage supply is fixed at 24 Vdc. This is for an open collector Encoder.

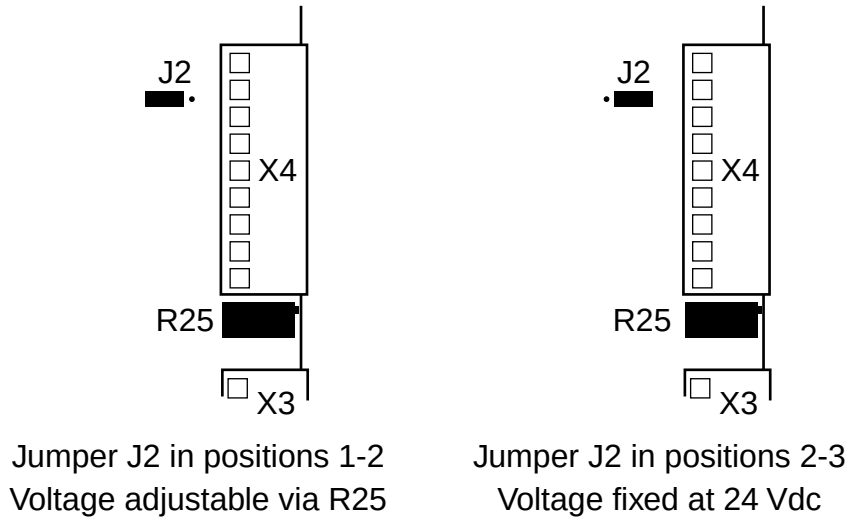

Figure 9: Settings of Jumpers J1 and J2

3.5.2 Configuring the Master/Slave Relationship

Jumper J3 configures whether a particular Encoder board is the master or slave in a multi-board application. Jumper J3 is located between the X5 and X4 connection blocks; see Figure 8 on page 20.

When the jumper is placed so as to cover the two rows of pins nearer to the X5 connection block, the input signal arriving at the X5 connection block (Master In) is routed to the X4 connection block (Slave Out).

However, when the jumper is placed so as to cover the two rows of pins nearer to the X4 connection block, the input signal arriving at connection block X3 (Motor Feedback) is routed to the X4 connection block (Slave Out).

Figure 10 shows an example of three Resolver boards wired together in a master / slave arrangement with J3 set appropriately.

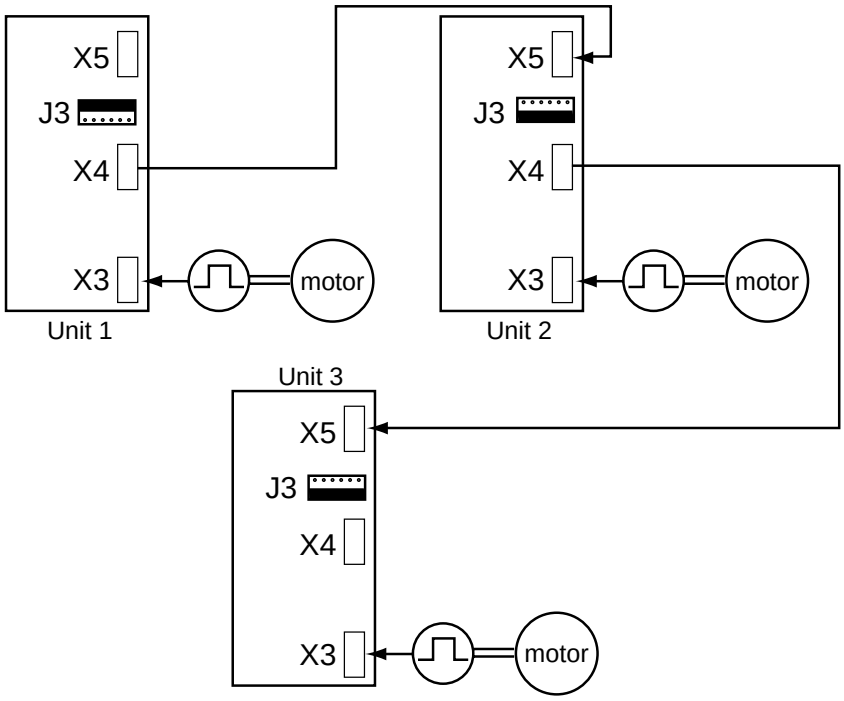

Figure 10: Example of Setting J3 for Master/Slave Configuration

3.5.3 High-Resolution Analog Input

The standard resolution for the analog reference signal is 10 bits. This may be increased to 12 bits with optional jumper IC1 (AD862AR-10).

Once you have acquired this part, locate jumper S1 on the Encoder board. It is near the KL3 connection terminal as shown in Figure 8 on page 20. Remove existing jumper S1 and replace it with jumper IC1. The resolution will increase to 12 bits the next time power is cycled.

3.6 UVC Parameter Settings for the Resolver Board

Once the Resolver board is installed, the solder bridges are set appropriately, and the UVC inverter is powered up, you should enter the necessary operational data by setting the following UVC parameters. See the UVC Programming Manual for further assistance.

1. Select the desired language with parameter 78.
2. Enter the data related to the motor that is connected to the UVC inverter. The parameters in Group 1 are used to record this data. Be careful when setting these parameters as accurate entry of this data is vital for correct measurement and internal processing.
3. Configure the basic parameters found in Group 2.

   Pay particular attention to parameter 2C because this parameter establishes the required drive type. If a mode other than the current mode is selected (for example, EC, NFO, or FO variant), and then a hardware or software reset is performed, mode-specific parameters will be added.

   Once these parameters are added, a Resolver board must be connected or an error message will be generated immediately after power-up.
4. Select the setpoint source by using parameter 31.
5. Select the required start and ramp-up / ramp-down response of the inverter with parameters 71 and 72.
6. Specify whether the inverter should automatically re-start if an error occurs by setting parameters 83 through 85 as needed.
7. Check parameter D1 to determine whether the correct option board was installed.
8. Enter the data specific to the feedback system in parameter BE.

9. Select the test mode specific to the drive type and feedback system with parameter 2A.

   After a hardware reset (power cycle) or software reset (setting parameter 2D to 1), and after the first start command is issued, a test run will be performed. This test determines the data specific to the motor and feedback system.

   If this run completes successfully, the inverter starts and accelerates to the commanded speed or torque. You should then reset parameter 2A to 0 so additional test runs are not performed after each power on.

   If the test run is unsuccessful, an error message is displayed.

3.7 Troubleshooting

Once all parameters are entered, several parameters are available to provide status about the operation of the UVC inverter:

- The actual power-specific data (such as currents and voltages on the line and motor connections) is found in parameter Group 0 (Service Data I).
- The motor model and actual inverter-specific statuses are found in parameter Group E and Group F (Service Data II and III).

For units using feedback, it can sometimes be difficult to locate the condition causing a fault. The following procedure is suggested for this situation:

1. Power up the UVC inverter.
2. Navigate to parameter BB.

   The mechanical rotation angle of the tachometer shaft is read in this parameter. If the parameter setting for the tachometer data (parameter BA or BE) is correct, the display runs through an angle of 360° during each mechanical revolution of the tachometer shaft.
3. Once the settings of the tachometer-specific parameters are checked and verified in step 2, test the power section. This is accomplished by setting parameter 2C to V / Hz-controlled operation (data value 0) and then performing a power cycle. The inverter should run in this mode of operation.

N O T E S

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